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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	:	MATTHEW B. SQUIRE, ET AL.
Serial No.	:	09/407,915
Filed	:	September 29, 1999
For	:	METHODS FOR AUTO-CONFIGURING A ROUTER ON AN IP SUBNET
Group No.	:	2141
Examiner	:	A.M. Mirza

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
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Sir:

APPELLANTS' BRIEF ON APPEAL

This Brief is submitted in triplicate on behalf of Appellants for the application identified above. A check is enclosed for the $330.00 fee for filing a Brief on Appeal. Please charge any additional necessary fees to Deposit Account No. 50-0208.

REAL PARTY IN INTEREST

The real party in interest for this appeal is the assignee of the application, NORTEL NETWORKS LTD.

RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences related to the present application which are currently pending.

STATUS OF CLAIMS

Claims 1–70 are pending in the present application. Claim 1 was rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 5,708,778 to *Monot* in view of U.S. Patent No. 6,012,088 to *Li et al.* Claims 1–6, 15–20, 30–34, 43–48 and 57–62 were rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 5,838,907 to *Hansen* in view of *Li et al.* Claims 7–14, 21–28, 35–42, 49–56 and 63–70 were rejected under 35 U.S.C. § 103(a) as being obvious over *Hansen* in view of *Li et al* and further in view of U.S. Patent No. 6,286,038 to *Richmeyer et al.* The rejection of pending claims 1–70 is appealed.

STATUS OF AMENDMENTS

No amendments to the claims were submitted following the final Office Action mailed August 25, 2003.

SUMMARY OF THE INVENTION

The present invention relates to autoconfiguration of a router on an Internet Protocol (IP) subnet. Network configuration, reconfiguration and management is a labor intensive process.

Specification, page 1, lines 20–31. Network attributes may include: the IP subnet mask; Dynamic Host Configuration Protocol (DHCP) forwarding data; DHCP server address; virtual local area network (VLAN) including tag identifications, types, protocols, addresses and port to VLAN mappings; Spanning Tree Group information; Simple Network Management Protocol (SNMP) server addresses; Open Shortest Path First (OSPF) timer information; Routing Information Protocol (RIP) broadcast timer information; and/or Virtual Router Redundancy Protocol (VRRP) information. Specification, page 3, lines 11–18.

In the present invention, a configuration determination module within an autoconfiguring data router automatically determines required configuration attributes by either (1) communicating with a network centralized configuration server via SNMP, (2) communicating with another data router via Internet Control Message Protocol (ICMP) or User Datagram Protocol (UDP), or (3) detecting and analyzing routing protocol control packets. Specification, page 3, line 19 through page 4, line 2.

ISSUES ON APPEAL

Claim 1 was rejected under 35 U.S.C. § 103(a) as being obvious over *Monot* in view of *Li et al.* Claims 1–6, 15–20, 30–34, 43–48 and 57–62 were rejected under 35 U.S.C. § 103(a) as being obvious over *Hansen* in view of *Li et al.* Claims 7–14, 21–28, 35–42, 49–56 and 63–70 were rejected under 35 U.S.C. § 103(a) as being obvious over *Hansen* in view of *Li et al* and further in view of *Richmeyer et al.* The issues on appeal are:

1. whether claim 1 was properly rejected under 35 U.S.C. § 103(a) as being obvious over *Monot* in view of *Li et al*;

2. whether claims 1–6, 15–20, 30–34, 43–48 and 57–62 were properly rejected under 35 U.S.C. § 103(a) as being obvious over *Hansen* in view of *Li et al*; and

3. whether claims 7–14, 21–28, 35–42, 49–56 and 63–70 were properly rejected under 35 U.S.C. § 103(a) as being obvious over *Hansen* in view of *Li et al* and further in view of *Richmeyer et al.*

GROUPING OF CLAIMS

Claims 1–70 are pending in the present application. Claim 1 was rejected under 35 U.S.C. § 103(a) as being obvious over *Monot* in view of *Li et al.* Claims 1–6, 15–20, 30–34, 43–48 and 57–62 were rejected under 35 U.S.C. § 103(a) as being obvious over *Hansen* in view of *Li et al.* Claims 7–14, 21–28, 35–42, 49–56 and 63–70 were rejected under 35 U.S.C. § 103(a) as being obvious over *Hansen* in view of *Li et al* and further in view of *Richmeyer et al.* For purposes of this appeal, the pending, rejected claims will be grouped together as follows:

Group A – claim 1;

Group B – claims 1–6, 15–20, 30–34, 43–48 and 57–62;

Group C – claims 7–14, 21–28, 35–42, 49–56 and 63–70;

Group D – claims 2, 16, 30, 44 and 58;

Group E – claims 5, 19, 33, 47 and 61;

Group F – claims 6, 20, 34, 48 and 62;

Group G – claims 7, 21, 35, 49 and 63;

Group H – claims 8, 22, 36, 50 and 64;

Group I – claims 11, 53 and 67;

Group J – claims 12, 26, 40, 54 and 68; and

Group K – claims 14, 28, 42, 56 and 70.

Groups A–K stand or fall independently. Patentability of the claims within each group is argued separately below.

ARGUMENT

Group A (Claim 1)

Claim 1 of Group A was rejected under 35 U.S.C. § 103(a) as being obvious over *Monot* in view of *Li et al.* This claim is properly considered separately from the claims of Groups B–K since the claim is subject to a different ground of rejection than the claims of Groups B–K, such that patentability (or lack thereof) over one ground of rejection is not necessarily dispositive of patentability over the other ground(s) of rejection.

In *ex parte* examination of patent applications, the Patent Office bears the burden of establishing a *prima facie* case of obviousness. MPEP § 2142, p. 2100-123 (8th ed. rev. 1 February 2003). Absent such a *prima facie* case, the applicant is under no obligation to produce evidence of nonobviousness. *Id.*

To establish a *prima facie* case of obviousness, three basic criteria must be met: First, there must be some suggestion or motivation, either in the references themselves or in the knowledge

generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant 's disclosure. MPEP § 2142 at p. 2100-124.

Claim 1 of Group A recites determination within a first network device of configuration attributes for operably connecting the first network device to a subnet based on configuration information for the subnet, and configuring the first network device for operable connection to the subnet according to the configuration attributes. Such a feature is not found within the cited references, taken alone or in combination. *Monot* teaches automatically selecting communication parameters for data terminal equipment (DTE) within a network, such as packet size, format, etc., in which the parameters for the terminal are determined by iteratively probing the network's carrier equipment starting with an initial set of parameters and utilizing any probe responses until the parameter set is narrowed to a set of correct parameters:

> The DTE executes an automatic configuration program for performing the method. A probe structured with respect to a particular configuration parameter, such as packet size, format, and so forth. The probe is a function of the protocol parameter being configured, selected previous probes for that parameters, and selected answers to the previous probes that the DCE provided in response thereto. The DCE receives the probe and responds with an answer. The automatic configuration program determines from the probe, the answer, selected ones of the prior probes, and selected ones of the prior answers whether a value that correctly configures the parameter may be established. If not, another probe is created based on the parameter value of the probe, the prior probes, the answer, and the prior answers. This cycle is repeated until the parameter value is established, or it is determined that the parameter value

> cannot be established. The DTE then configures the next parameter in the same iterative manner.

Monot, column 2, lines 44–62. However the system disclosed in *Monot* uses one probe (or set of probes) for each parameter to "iteratively restrict" the current set of potential parameter values until a correct value can be determined from the current set of potential values. *Monot*, column 2, lines 12–13 and 30–34. Thus *Monot* does not teach detecting configuration, merely selecting from among a known range of parameter values.

In addition, the probe does not involve detecting configuration information for the network, only parameter values for a communications protocol. The final Office Action concedes that *Monot* fails to disclose configuration attributes for operably connecting the first network device to a subnet based on configuration information for the subnet detected by the first network device, relying on *Li et al* as teaching such a feature. Paper No. 15, pages 2–3. *Li et al* describes an "automatic configuration" process in which a device automatically connects itself to an appropriate location on the Internet and to download a configuration information. *Li et al*, column 9, lines 15–16. With the exception of certain identification information provided by the user (e.g., a desired domain name), all of the configuration information to configure the *Li* Internet access device is stored in a database in an Internet Service Provider (ISP). *Li et al*, Figure 11b, steps 724 and 726, Figure 12, column 9, lines 52–53. Thus the *Li et al* system simply calls up the ISP and downloads the configuration information. Nothing in *Li et al* suggests having the Internet access device search the network to detect configuration attributes in the manner recited in the claim of Group A.

The Office Action proposes combining the respective teachings of *Monot* and *Li et al* "to be able to configure the existing infrastructure of the Network in order to retrieve configuration data from any location." Paper No. 15, page 3. However, the teachings of the references cited do not support the conclusion that such a result would be obtained by the combination proposed. *Li et al* teaches retrieval of configuration information from a single, predefined location; *Monot* teaches testing predefined ranges of parameters. Neither reference suggests that configuration data might be retrieved from any location.

In addition, the references do not support a reasonable expectation of success in combining the references as proposed to achieve the claimed invention. The two references are directed at different problems (selecting parameters for a communications protocol versus IP address configuration), such that successful combination is not apparent.

Group B (Claims 1–6, 15–20, 30–34, 43–48 and 57–62)

Claims 1–6, 15–20, 30–34, 43–48 and 57–62 of Group B were rejected under 35 U.S.C. § 103(a) as being obvious over *Hansen* in view of *Li et al*. These claims are properly grouped together and considered separately from the claims of Groups A and C–K since (a) the claims are subject to a common ground of rejection different than that on which the claims of Groups A, C and F–K were rejected, such that patentability (or lack thereof) over one ground of rejection is not necessarily dispositive of patentability over the other ground(s) of rejection, and (b) a decision with respect to Group B may obviate the need for consideration of Groups D–F.

Independent claims 1, 15, 29, 43, and 57 of Group B each recite determination within a first network device of configuration attributes for operably connecting the first network device to a subnet based on configuration information for the subnet, and configuring the first network device for operable connection to the subnet according to the configuration attributes. Such a feature is not found within the cited references, taken alone or in combination. *Hansen* describes "a configuration manager for configuring a network device remotely coupled thereto . . ." *Hansen*, Abstract (emphasis added). In the system disclosed by *Hansen*, a network device configuration tool 10 is located within a remote computer system 2 rather than within a network device 26 being configured, and constructs a configuration file suitable for export from computer 2 to network device 26. *Hansen*, column. 4, lines 65–67. The configuration file (with configuration information) is then sent by the computer system 2 to the remotely located network device 26. *Hansen*, column 5, lines 22–26. Accordingly, *Hansen* does not teach "the use of a configuration determination module of the first network device for determining configuration attributes for operably connecting the first network device to the subnet." *Hansen* does not teach a configuration determination module–and specifically does not teach an autoconfiguration module--within the first network device.

In addition, *Hansen* only teaches a guided configuration process employing requests to the network administrator for configuration information. *Hansen* teaches the use of a configuration guide 18 within computer 2 to collect information necessary to configure the network device by engaging the network administrator in a dialog during which the configuration guide 18 generates a series of graphical user interfaces (GUIs). Each GUI displays a request for information and

provides areas in which the requested information may be inputted and buttons for guiding the network administrator through the dialog. *Hansen*, column 14, lines 23–29. *Hansen* does not teach or suggest detecting configuration information for a subnet by a network device to determine configuration attributes for operably connecting the network device to the subnet.

The Office Action concedes that *Hansen* does not disclose configuring the first network device with an auto configuration module, but asserts that *Li et al* teaches automatic configuration according to configuration information downloaded to the device. Paper No. 15, page 3. However, *Li et al* does not cure the defect of *Hansen* in failing to describe detection of configuration attributes by the device being configured as recited in the claims. Accordingly, the combination fails to disclose at least one limitation of the claims.

Group C (Claims 7–14, 21–28, 35–42, 49–56 and 63–70)

Claims 7–14, 21–28, 35–42, 49–56 and 63–70 of Group C were rejected under 35 U.S.C. § 103(a) as being obvious over *Hansen* in view of *Li et al* and further in view of *Richmeyer et al.* These claims are properly grouped together and considered separately from the claims of Groups A–B and D–K since (a) the claims are subject to a common ground of rejection different than that on which the claims of Groups A–B and D–F are rejected, such that patentability (or lack thereof) over one ground of rejection is not necessarily dispositive of patentability over the other grounds of rejection, and (b) a decision with respect to the claims of Group C may obviate the need for consideration of Groups G–K.

The present application is a Continued Prosecution Application filed January 2, 2003, and is therefor entitled to the benefit of 35 U.S.C. § 103(c). As established by the concurrently-filed Statement of Common Ownership, the present application and *Reichmeyer et al* were, at the time of the invention claimed herein, owned by or subject to an obligation of assignment to a single entity. Accordingly, *Reichmeyer et al* is not prior art for the purposes of obviousness.

Group D (Claims 2, 16, 30, 44 and 58)

Claims 2, 16, 30, 44 and 58 of Group D were rejected under 35 U.S.C. § 103(a) as being obvious over *Hansen* in view of *Li et al*. These claims are properly grouped together and considered separately from the claims of Groups A–C and E–K since (a) the claims are subject to a common ground of rejection different than that on which the claims of Groups A, C and G–K are rejected, such that patentability (or lack thereof) over one ground of rejection is not necessarily dispositive of patentability over the other ground(s) of rejection, and (b) the claims recite a feature not found in the claims of Groups B and E–F that patentably distinguishes the claimed invention over the prior art: automatically configuring the network device by an autoconfiguration module within the network device.

Claims 2, 16, 30, 44 and 58 of Group D each recite automatically configuring the network device for operable connection to the subnet. Such a feature is not found within the cited references. *Monot* merely teaches selecting parameters for a communications protocol once connection to the network is established, but does not teach automatically configuring connection of the device to the network.

Group E (Claims 5, 19, 33, 47 and 61)

Claims 5, 19, 33, 47 and 61 of Group E were rejected under 35 U.S.C. § 103(a) as being obvious over *Hansen* in view of *Li et al.* These claims are properly grouped together and considered separately from the claims of Groups A–D and G–K since (a) the claims are subject to a common ground of rejection different than that on which the claims of Groups A, C and G–K are rejected, such that patentability (or lack thereof) over one ground of rejection is not necessarily dispositive of patentability over the other ground(s) of rejection, and (b) the claims recite a feature not found in the claims of Groups B, D and F that patentably distinguishes the claimed invention over the prior art: that the configuration attributes comprise an IP subnet mask that is determined based on configuration information unique to the subnet and derived from passively listening to router control traffic.

Claims 5, 19, 33, 47 and 61 of Group E each recite that the configuration attributes comprise an IP subnet mask that is determined based on configuration information unique to the subnet and derived from passively listening to router control traffic. Such a feature is not found in the cited references. Neither *Hansen* nor *Li et al* teach determination of subnet masks, nor deriving such a mask by passively listening to traffic.

Group F (Claims 6, 20, 34, 48 and 62)

Claims 6, 20, 34, 48 and 62 of Group F were rejected under 35 U.S.C. § 103(a) as being obvious over *Hansen* in view of *Li et al.* These claims are properly grouped together and considered separately from the claims of Groups A–E and G–K since (a) the claims are subject to a common

ground of rejection different than that on which the claims of Groups A, C and G–K are rejected, such that patentability (or lack thereof) over one ground of rejection is not necessarily dispositive of patentability over the other ground(s) of rejection, and (b) the claims recite a feature not found in the claims of Groups B and D–E that patentably distinguishes the claimed invention over the prior art: that the configuration attributes comprise DHCP forwarding data or a DHCP server address.

Claims 6, 20, 34, 48 and 62 of Group F each recite that the configuration attributes comprise DHCP forwarding data or a DHCP server address. Such a feature is not found within the cited references.

Group G (Claims 7, 21, 35, 49 and 63)

Claims 7, 21, 35, 49 and 63 of Group G were rejected under 35 U.S.C. § 103(a) as being obvious over *Hansen* in view of *Li et al* and further in view of *Reichmeyer et al.* These claims are properly grouped together and considered separately from the claims of Groups A–F and H–K since (a) the claims are subject to a common ground of rejection different than that on which the claims of Groups A–B and D–F are rejected, such that patentability (or lack thereof) over one ground of rejection is not necessarily dispositive of patentability over the other ground(s) of rejection, and (b) the claims recite a feature not found in the claims of Groups C and G–K that patentably distinguishes the claimed invention over the prior art: that the configuration attributes comprise virtual local area network (VLAN) information including tag identifications, types, protocols, addresses, and port-to-VLAN mappings.

Claims 7, 21, 35, 49 and 63 of Group G each recite that the configuration attributes comprise virtual local area network (VLAN) information including tag identifications, types, protocols, addresses, and port-to-VLAN mappings. Such a feature is not found in either *Hansen* or *Li et al.*

Group H (Claims 8, 22, 36, 50 and 64)

Claims 8, 22, 36, 50 and 64 of Group H were rejected under 35 U.S.C. § 103(a) as being obvious over *Hansen* in view of *Li et al* and further in view of *Reichmeyer et al.* These claims are properly grouped together and considered separately from the claims of Groups A–G and I–K since (a) the claims are subject to a common ground of rejection different than that on which the claims of Groups A–B and D–F are rejected, such that patentability (or lack thereof) over one ground of rejection is not necessarily dispositive of patentability over the other ground(s) of rejection, and (b) the claims recite a feature not found in the claims of Groups C, G and I–K that patentably distinguishes the claimed invention over the prior art: that the configuration attributes comprise at least one of Spanning Tree Group information, Simple Network Management Protocol (SNMP) server addresses, Open Shortest Path First (OSPF) timer information, Routing Information Protocol (RIP) broadcast timer information, and Virtual Router Redundancy Protocol (VRRP) information.

Claims 8, 22, 36, 50 and 64 of Group H each recite that the configuration attributes comprise at least one of Spanning Tree Group information, Simple Network Management Protocol (SNMP) server addresses, Open Shortest Path First (OSPF) timer information, Routing Information Protocol (RIP) broadcast timer information, and Virtual Router Redundancy Protocol (VRRP) information. Such a feature is not found in either *Hansen* or *Li et al.*

Group I (Claims 11, 53 and 67)

Claims 11, 53 and 67 of Group I were rejected under 35 U.S.C. § 103(a) as being obvious over *Hansen* in view of *Li et al* and further in view of *Reichmeyer et al.* These claims are properly grouped together and considered separately from the claims of Groups A–H and J–K since (a) the claims are subject to a common ground of rejection different than that on which the claims of Groups A–B and D–F are rejected, such that patentability (or lack thereof) over one ground of rejection is not necessarily dispositive of patentability over the other ground(s) of rejection, and (b) the claims recite a feature not found in the claims of Groups C, G–H and J–K that patentably distinguishes the claimed invention over the prior art: that the configuration attributes are determined by sending addresses of network neighbors to a centralized configuration server.

Claims 11, 53 and 67 of Group I each recite that the configuration attributes are determined by sending addresses of network neighbors to a centralized configuration server. Such a feature is not found within the cited references.

Group J (Claims 12, 26, 40, 54 and 68)

Claims 12, 26, 40, 54 and 68 of Group J were rejected under 35 U.S.C. § 103(a) as being obvious over *Hansen* in view of *Li et al* and further in view of *Reichmeyer et al.* These claims are properly grouped together and considered separately from the claims of Groups A–I and K since (a) the claims are subject to a common ground of rejection different than that on which the claims of Groups A–B and D–F are rejected, such that patentability (or lack thereof) over one ground of rejection is not necessarily dispositive of patentability over the other ground(s) of rejection, and (b)

the claims recite a feature not found in the claims of Groups C, G–I and K that patentably distinguishes the claimed invention over the prior art: that the configuration attributes are determined by sending a message to another data router in the subnet.

Claims 12, 26, 40, 54 and 68 of Group J each recite that the configuration attributes are determined by sending a message to another data router in the subnet. Such a feature is not found within the cited references.

Group K (Claims 14, 28, 42, 56 and 70)

Claims 14, 28, 42, 56 and 70 of Group K were rejected under 35 U.S.C. § 103(a) as being obvious over *Hansen* in view of *Li et al* and further in view of *Reichmeyer et al.* These claims are properly grouped together and considered separately from the claims of Groups A–J since (a) the claims are subject to a common ground of rejection different than that on which the claims of Groups A–B and D–F are rejected, such that patentability (or lack thereof) over one ground of rejection is not necessarily dispositive of patentability over the other ground(s) of rejection, and (b) the claims recite a feature not found in the claims of Groups C and G–J that patentably distinguishes the claimed invention over the prior art: that the configuration attributes are determined by analyzing detected routing protocol control packets.

Claims 14, 28, 42, 56 and 70 of Group K each recite that the configuration attributes are determined by analyzing detected routing protocol control packets. Such a feature is not found in either *Hansen* or *Li et al.*

CONCLUSION

None of the cited references, taken alone or in combination, depict or describe all features of the invention claimed in Groups A–K. Therefore, the rejections under 35 U.S.C. § 103 are improper. Applicant respectfully requests that the Board of Appeals reverse the decision of the Examiner below rejecting pending claims 1–70 in the application.

Respectfully submitted,

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APPENDIX TO APPELLANT'S BRIEF ON APPEAL
PENDING CLAIMS ON APPEAL

1. A method of configuring a first network device for connection to a communications network subnet having a second network device, the method comprising:

determining, with a configuration determination module of the first network device, configuration attributes for operably connecting the first network device to the subnet based on configuration information for the subnet detected by the first network device; and

configuring the first network device, with an autoconfiguration module of the first network device, according to the configuration attributes so that the first network device is operably connected to the subnet.

2. A method according to claim 1, wherein configuring the first network device is performed automatically by the autoconfiguration module.

3. A method according to claim 1, wherein configuring the first network device is performed as a guided process in which the autoconfiguration module interacts with a user and presents to the user suggested configuration choices based on the configuration attributes.

4. A method according to claim 3, wherein the suggested configuration choices are accompanied by an explanation to the user as to why the configuration choices have been suggested.

5. A method according to claim 1, wherein the configuration attributes comprise an Internet Protocol (IP) subnet mask determined based upon the configuration information unique to the subnet and derived from passively listening to router control traffic detected by the first network device at interfaces between the first network device and the subnet.

6. A method according to claim 1, wherein the configuration attributes comprise at least one of Dynamic Host Configuration Protocol (DHCP) forwarding data and DHCP server address.

7. A method according to claim 1, wherein the configuration attributes comprise virtual local area network (VLAN) information including tag identifications, types, protocols, addresses, and port-to-VLAN mappings.

8. A method according to claim 1, wherein the configuration attributes comprise at least one of Spanning Tree Group information, Simple Network Management Protocol (SNMP) server addresses, Open Shortest Path First (OSPF) timer information, Routing Information Protocol (RIP) broadcast timer information, and Virtual Router Redundancy Protocol (VRRP) information.

9. A method according to claim 1, wherein the step of determining configuration attributes further comprises communicating with a network centralized configuration server.

10. A method according to claim 9, wherein the network centralized configuration server uses Simple Network Management Protocol (SNMP) to communicate.

11. A method according to claim 9, wherein the step of communicating with a network centralized configuration server comprises:

sending to the centralized configuration server a message containing the addresses of network neighbors on the subnet;

searching in a configuration database of the centralized configuration server for configuration attributes relevant to the first network device; and

forwarding the configuration attributes from the configuration database to the first network device.

12. A method according to claim 1, wherein the step of determining configuration attributes further comprises communicating with the second network device.

13. A method according to claim 12, wherein the step of communicating with the second network device uses a protocol based on Internet Control Message Protocol (ICMP) or User Datagram Protocol (UDP).

14. A method according to claim 1, wherein the step of determining configuration attributes comprises analyzing routing protocol control packets detected by the first network device.

15. An autoconfiguring data router connected to a communications network subnet having a second network data router, the autoconfiguring data router comprising:

a configuration determination module that determines configuration attributes for operably connecting the autoconfiguring data router to the subnet based on configuration information for the subnet detected by the autoconfiguring data router; and

an autoconfiguration module that configures the autoconfiguring data router according to the configuration attributes so that the autoconfiguring data router is operably connected to the subnet.

16. An autoconfiguring data router according to claim 15, wherein the autoconfiguration module configures the autoconfiguring data router automatically.

17. An autoconfiguring data router according to claim 15 wherein the autoconfiguration module configures the autoconfiguring data router using a guided process in which the autoconfiguration module interacts with a user and presents to the user suggested configuration choices based on the configuration attributes.

18. An autoconfiguring data router according to claim 17, wherein the autoconfiguration module accompanies the suggested configuration choices with an explanation to the user as to why the configuration choices have been suggested.

19. An autoconfiguring data router according to claim 15, wherein the network attributes comprise an Internet Protocol (IP) subnet mask determined based upon the configuration information unique to the subnet and derived from passively listening to router control traffic detected by the autoconfiguring data router at interfaces between the first network device and the autoconfiguring data router.

20. An autoconfiguring data router according to claim 15, wherein the configuration attributes comprise at least one of Dynamic Host Configuration Protocol (DHCP) forwarding data and DHCP server address.

21. An autoconfiguring data router according to claim 15, wherein the configuration attributes comprise virtual local area network (VLAN) information including tag identifications, types, protocols, addresses, and port-to-VLAN mappings.

22. An autoconfiguring data router according to claim 15, wherein the configuration attributes comprise at least one of Spanning Tree Group information, Simple Network Management Protocol (SNMP) server addresses, Open Shortest Path First (OSPF) timer information, Routing Information Protocol (RIP) broadcast timer information, and Virtual Router Redundancy Protocol (VRRP) information.

23. An autoconfiguring data router according to claim 15, wherein the configuration determination module communicates with a network centralized configuration server to determine the configuration attributes.

24. An autoconfiguring data router according to claim 23, wherein the network centralized configuration server uses Simple Network Management Protocol (SNMP) to communicate with the configuration determination module.

25. An autoconfiguring data router according to claim 15, wherein the configuration determination module receives relevant configuration attributes from the centralized configuration server .

26. An autoconfiguring data router according to claim 15, wherein the configuration determination module communicates with a second network data router to determine the configuration attributes.

27. An autoconfiguring data router according to claim 26, wherein the configuration determination module uses a protocol based on Internet Control Message Protocol (ICMP) or User Datagram Protocol (UDP) to communicate with the second network data router.

28. An autoconfiguring data router according to claim 15, wherein the configuration determination module analyzes routing protocol control packets detected by the autoconfiguring data router to determine the configuration attributes.

29. A computer network having at least one subnetwork, the at least one subnetwork having a plurality of data routers that communicate data packets over the network, the subnetwork including at least one autoconfiguring data router, the at least one autoconfiguring data router comprising:

a configuration determination module that determines configuration attributes for operably connecting the autoconfiguring data router to the subnet based on configuration information for the subnet detected by the autoconfiguring data router; and

an autoconfiguration module that configures the autoconfiguring data router according to the configuration attributes so that the autoconfiguring data router is operably connected to the subnet.

30. A computer network according to claim 29, wherein the autoconfiguration module configures the autoconfiguring data router automatically.

31. A computer network according to claim 29, wherein the autoconfiguration module configures the autoconfiguring data router using a guided process in which the autoconfiguration module interacts with a user and presents to the user suggested configuration choices based on the configuration attributes.

32. A computer network according to claim 31, wherein the autoconfiguration module accompanies the suggested configuration choices with an explanation to the user as to why the configuration choices have been suggested.

33. A computer network according to claim 29, wherein the network attributes comprise an Internet Protocol (IP) subnet mask determined based upon the configuration information unique to the subnet and derived from passively listening to router control traffic detected by the first network device at interfaces between the first network device and the subnet.

34. A computer network according to claim 29, wherein the configuration attributes comprise at least one of Dynamic Host Configuration Protocol (DHCP) forwarding data and DHCP server address.

35. A computer network according to claim 29, wherein the configuration attributes comprise virtual local area network (VLAN) information including tag identifications, types, protocols, addresses, and port-to-VLAN mappings.

36. A computer network according to claim 29, wherein the configuration attributes comprise at least one of Spanning Tree Group information, Simple Network Management Protocol (SNMP) server addresses, Open Shortest Path First (OSPF) timer information, Routing Information Protocol (RIP) broadcast timer information, and Virtual Router Redundancy Protocol (VRRP) information.

37. A computer network according to claim 29, wherein the configuration determination module communicates with a network centralized configuration server to determine the configuration attributes.

38. A computer network according to claim 37, wherein the network centralized configuration server uses Simple Network Management Protocol (SNMP) to communicate with the configuration determination module.

39. A computer network according to claim 37, wherein the configuration determination module receives relevant configuration attributes from the centralized configuration server .

40. A computer network according to claim 29, wherein the configuration determination module communicates with a second network data router to determine the configuration attributes.

41. A computer network according to claim 40, wherein the configuration determination module uses a protocol based on Internet Control Message Protocol (ICMP) or User Datagram Protocol (UDP) to communicate with the second network data router.

42. A computer network according to claim 29, wherein the configuration determination module analyzes routing protocol control packets detected by the autoconfiguring data router to determine the configuration attributes.

43. A computer program product for use on a computer system for configuring a first network device for connection to a communications network subnet having a second network device, the computer program product comprising a computer-usable medium having computer-readable program code thereon, the computer readable program code including:

program code for determining configuration attributes for operably connecting the first network device to the subnet based on configuration information for the subnet detected by the first network device; and

program code for configuring the first network device according to the configuration attributes so that the first network device is operably connected to the subnet.

44. A computer program product according to claim 43, wherein configuring the first network device is performed automatically by the autoconfiguration module.

45. A computer program product according to claim 43, wherein configuring the first network device is performed as a guided process in which the autoconfiguration module interacts with a user and presents to the user suggested configuration choices based on the configuration attributes.

46. A computer program product according to claim 45, wherein the suggested configuration choices are accompanied by an explanation to the user as to why the configuration choices have been suggested.

47. A computer program product according to claim 43, wherein the configuration attributes comprise an Internet Protocol (IP) subnet mask determined based upon the configuration information unique to the subnet and derived from passively listening to router control traffic detected by the first network device at interfaces between the first network device and the subnet.

48. A computer program product according to claim 43, wherein the configuration attributes comprise at least one of Dynamic Host Configuration Protocol (DHCP) forwarding data and DHCP server address.

49. A computer program product according to claim 43, wherein the configuration attributes comprise virtual local area network (VLAN) information including tag identifications, types, protocols, addresses, and port-to-VLAN mappings.

50. A computer program product according to claim 43, wherein the configuration attributes comprise at least one of Spanning Tree Group information, Simple Network Management Protocol (SNMP) server addresses, Open Shortest Path First (OSPF) timer information, Routing Information Protocol (RIP) broadcast timer information, and Virtual Router Redundancy Protocol (VRRP) information.

51. A computer program product according to claim 43, wherein the program code for determining configuration attributes further comprises program code for communicating with a network centralized configuration server.

52. A computer program product according to claim 51, wherein the network centralized configuration server uses Simple Network Management Protocol (SNMP) to communicate.

53. A computer program product according to claim 51, wherein the program code for communicating with a network centralized configuration server comprises:

program code for sending to the centralized configuration server a message containing the addresses of network neighbors on the subnet;

program code for searching in a configuration database of the centralized configuration server for configuration attributes relevant to the first network device; and

program code for forwarding the configuration attributes from the configuration database to the first network device.

54. A computer program product according to claim 43, wherein the program code for determining configuration attributes further comprises program code for communicating with the second network device.

55. A computer program product according to claim 54, wherein the program code for communicating with the second network device uses a protocol based on Internet Control Message Protocol (ICMP) or User Datagram Protocol (UDP).

56. A computer program product according to claim 43, wherein the program code for determining configuration attributes comprises program code for analyzing routing protocol control packets detected by the first network device.

57. An autoconfiguring data router connected to a communications network subnet having a second network data router, the autoconfiguring data router comprising:

means for determining configuration attributes for operably connecting the autoconfiguring data router to the subnet based on configuration information for the subnet detected by the autoconfiguring data router; and

means for configuring the autoconfiguring data router according to the configuration attributes so that the autoconfiguring data router is operably connected to the subnet.

58. An autoconfiguring data router according to claim 57, wherein the means for configuring the autoconfiguring data router operates automatically.

59. An autoconfiguring data router according to claim 57, wherein the means for configuring the autoconfiguring data router uses a guided process in which the means for configuring interacts with a user and presents to the user suggested configuration choices based on the configuration attributes.

60. An autoconfiguring data router according to claim 59, wherein the suggested configuration choices are accompanied by an explanation to the user as to why the configuration choices have been suggested.

61. An autoconfiguring data router according to claim 57, wherein the configuration attributes comprise an Internet Protocol (IP) subnet mask determined based upon the configuration information unique to the subnet and derived from passively listening to router control traffic detected by the first network device at interfaces between the first network device and the subnet.

62. An autoconfiguring data router according to claim 57, wherein the configuration attributes comprise at least one of Dynamic Host Configuration Protocol (DHCP) forwarding data and DHCP server address.

63. An autoconfiguring data router according to claim 57, wherein the configuration attributes comprise virtual local area network (VLAN) information including tag identifications, types, protocols, addresses, and port-to-VLAN mappings.

64. An autoconfiguring data router according to claim 57, wherein the configuration attributes comprise at least one of Spanning Tree Group information, Simple Network Management Protocol (SNMP) server addresses, Open Shortest Path First (OSPF) timer information, Routing Information Protocol (RIP) broadcast timer information, and Virtual Router Redundancy Protocol (VRRP) information.

65. An autoconfiguring data router according to claim 57, wherein the means for determining configuration attributes further comprises means for communicating with a network centralized configuration server.

66. An autoconfiguring data router according to claim 65, wherein the network centralized configuration server uses Simple Network Management Protocol (SNMP) to communicate with the means for communicating.

67. An autoconfiguring data router according to claim 65, wherein the means for communicating with a network centralized configuration server comprises:

means for sending to the centralized configuration server a message containing the addresses of network neighbors on the subnet;

means for searching in a configuration database of the centralized configuration server for configuration attributes relevant to the autoconfiguring data router; and

means for forwarding the configuration attributes from the configuration database to the autoconfiguring data router.

68. An autoconfiguring data router according to claim 57, wherein the means for determining configuration attributes further comprises means for communicating with the second network data router.

69. An autoconfiguring data router according to claim 68, wherein the means for communicating with the second network data router uses a protocol based on Internet Control Message Protocol (ICMP) or User Datagram Protocol (UDP).

70. An autoconfiguring data router according to claim 57, wherein the means for determining configuration attributes further comprises means for analyzing routing protocol control packets detected by the autoconfiguring data router.